



*In Conjunction with the American Chemical Society  
Student Affiliates at the University of Pittsburgh*



Volume 26, Issue 7

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**It's Back!**  
REGISTRATION



## Fall Term (2191) Registration

**March 16** Deadline for applying for August 2018 graduation (140 Thackeray Hall).

**March 26** Fall Term (2191) Registration begins based on credits earned.

→ **You will be notified of your registration time on your my.pitt.edu page.**

Advisees who already have a permanent advisor should make their registration appointments with that advisor on or after **March 12** for Fall Term (2191).

Advisees who were asked to select their permanent advisors (via an email sent Feb. 5) should schedule their Fall term registration appointment with their new advisor after **March 12**.

New advisees who have declared chemistry as his or her major within A&S should make an appointment with Dr. George Bandik, Dr. Ericka Huston, or Dr. Michelle Ward after **March 12** for Fall Term (2191) in 107 CHVRN.

### Departmental Honors? Here's How...

Students who wish to graduate with Chemistry Department honors must satisfy four departmental requirements. Students must have:

- (a) an overall QPA of 3.00 or better
- (b) a chemistry QPA of 3.25 or better
- (c) have completed at least 2 credits of  
Chem 1710-Undergraduate Research
- (d) completed Chem 1711-Undergraduate Research Writing.

**Good luck as you strive towards academic excellence!**

## 2017-2018 ACS-SA Officers and Staff

Mitchell Harmatz-Co-President  
Mariah N. Mascara-Co-President  
Ryan Gilbert-Co-Vice-President  
Alex Gerber-Co-Vice-President  
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Visit us at <http://www.chem.pitt.edu/acs-sa/>

CHEM  
MAJOR  
NEWS

# ACS-SA Schedule for the Spring Term



## MARCH

- 02 Registration Session for Fall 2191**
- 09 SPRING BREAK**
- 16 Preparing for Saturday Science to be held on March 17!**
- 23 Trivia Day**
- 30 Officer Nominations for the 2018-2019 academic year**

## APRIL

- 06 Officer Elections for 2018-2019**
- 13 SENIOR FAREWELL**

## CAMPAIGN! VOTE! WIN!

Have you ever wanted to lead a nationally acknowledged award winning student group? If you aspire to such things why not consider running for an office with our ACS-SA group. We boast some 100+ members and have been recognized for the past 26 years by the national ACS for outstanding programing.

Nominations for our 4 elected positions: president, vice president, treasurer and secretary will be held on April 6th at our weekly meeting, 12:00 Noon in 150 CHVRN, and elections will be held on April 13th.

Stefan Kaliszuk has agreed to be our Green Chemistry Contributor for next year. John Bielanin and Kalon Overholt have agreed to serve as Outreach Coordinators next year and Shelby Szott and Justin Maier will continue on the Tech Team. We will still need two folks to volunteer as newsletter editors. If you are interested, please let George know.



## SMALL GRANTS FOR YOUR PROJECTS.

The A&S Office of Undergraduate Research, Scholarship and Creative Activity is offering small grants for your individual research or teaching projects, presentations or creative endeavors. These grants of up to \$500 are available for the following kinds of expenses:

- research/project supplies
- travel if you are going to present a paper at a conference or perform in an artistic endeavor.

To apply for a research/creative endeavors or travel/presentation grant, you must:

1. Find a faculty sponsor for your project.
2. Complete the application form. Include a detailed description of your project or travel plans and budget.
3. Return the signed form to the Office of Undergraduate Research, Scholarship and Creative Activity, 209 THACK.

## Try Something Different...

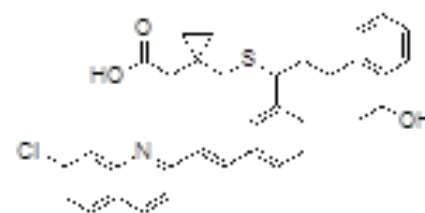
*Need something new and exciting in your life? Tired of the same old thing? How about some new (or not always offered) courses for the Fall term? Three elective courses being offered this fall may bring that zing back into your life! May we suggest:*

### Chemistry 1310-"Organic Synthesis of Drug Molecules"

**CHEM 1310** (Chevron Science Center 132 on Monday and Wednesday from 11:00-11:50 am in the Fall 2018) is a 2-credit, advanced undergraduate course that builds onto sophomore organic chemistry by applying the learned principles to the synthesis of FDA-approved drug molecules. The emphasis of the course will be on analyzing the molecular structures of drugs in a retrosynthetic fashion, followed by developing suitable synthetic routes to these molecules. The reaction mechanisms of select key steps of these syntheses will be discussed in more detail. Further concepts to be learned include fundamental functional group interconversions, chemoselectivity and protecting group use, stereoselective synthesis, and organometallic chemistry. Students will learn about the complexities of modern drug molecules and their assembly in a highly interactive classroom environment, where you will have the freedom to design your own syntheses and discuss them with your fellow classmates. If you are interested in pharmaceutical research and development, this is a highly recommended course. Please contact the instructor, Dr. Alex Deiters, with any questions: [deiters@pitt.edu](mailto:deiters@pitt.edu) (<http://www.deiterslab.org>).



For example: **Montelukast** (Singulair), Merck (\$3B / year sales), anti-inflammatory agent for asthma



### CHEM 1620 – "Atoms, Molecules, and Materials – Introduction to Nanomaterials"

This will be a course designed to increase students' knowledge and understanding of emerging field of nanotechnology. Nanotechnology deals with materials in nanometer scales, typically one to 100 nanometers. One nanometer is one billionth of a meter; approximately the length of five silicon atoms placed side-by-side or the width of a single strand of DNA. On nanometer scale, materials may possess new physical properties or exhibit new physical phenomena. For example, band gaps of semiconductors can be effectively tuned by adjusting their nano-dimensions. For nanomaterials, number of surface atoms becomes a significant fraction of the total number of atoms and the surface energy starts to dominate. This changes thermal stability and catalytic properties of many materials as we know them.

During the course, the students will gain a sound appreciation of different techniques and instruments involved in the preparation and characterization of nanomaterials. Current and future applications of nanomaterials in medicine, defense, energy production, and computation will be also discussed.

### Chemistry 1810-"Chemical Biology"

Revolutionary transformations in chemistry and biology have led to a merging at the boundary of these disciplines where contributions from both fields impact our molecular and quantitative understanding of biology. Rapid growth in this area has been driven in part by researchers applying synthesis, quantitative analysis, and theoretical reasoning to the study complex cellular processes. This course focuses on enzyme mechanisms in biological pathways, kinetics and thermodynamics, and chemical tools to probe and screen components of the cell. Other topics that will be discussed include DNA/RNA processing, macromolecular interactions, chemical signaling, posttranslational modifications, chemical syntheses of biomolecules, and the development of assays for high throughput drug screening.

This course is ideal for students interested in the interface between biology and chemistry. You will first learn to recognize sufficient unresolved problems in biology that will benefit from a whole system chemical and molecular approach to analysis. Chemical tools from all areas of chemistry (analytical, inorganic, organic, and physical) will be employed to characterize and elucidate biological processes. This course will be taught from both a "top down" and "bottom up" approach to characterizing cellular responses. Individual interactions and mechanisms of biological pathways ("bottom up") will be discussed in addition to and in context with the analysis of a global cellular response ("top down") to chemical agents such as drugs, inhibitors, or chemical probes.

Chem 1810 fulfills one of the two elective biological courses for the chemistry bioscience option. Prerequisites include both Biosci 160 and Chem 320. Students can only receive credit for one of the following courses: Chem 1810, Biosci1000, or Biosci 1810. **So as you can see, there is something for every chemical taste available to you this Fall!!**



# Green Chemistry

by: Andrew Warburton, *Green Chemistry Contributor*



Hi everyone! I hope you had a wonderful and relaxing Spring Break! It was well deserved after completing over half the semester. Can you believe it? The spring semester is nearly complete. For my graduating seniors out there, I want to personally extend my congrats to you. It's been quite a journey. Now is a time of jubilation and recollection. This fleeting experience of college is about to turn into one of the most amazing memories of your life! Make the most of it and keep up with the incredible friends you have made here. Whether it is graduate school, medical school, industry, gap year, research, peace corps, etc., I implore you to keep up with your friends. They will be your plinth onto which you can build your life and legacy – a support system to help you bounce back when you have fallen and celebrate when you have peaked.

To my juniors reading this article, I want to make sure you're not losing focus on what's important. Like the seniors, you probably have made some plans for after graduation and now is the time to prep yourself. If you're applying to graduate/medical school, get your personal statement ready and make sure all of your letter of rec writers are on-board. Good luck with your standardized tests. Remember, some of the best assets are students who have been in your position who can offer sagely advice. Don't get lost in the nitty gritty and keep the big picture in mind. Regardless of what path you end up taking, you'll get there and you'll be great at it!

To my underclassmen reading this article, congratulations on almost finishing another semester of college! It's incredible how fast the time flies. Make sure that you continue to do well in classes and start to think about what path you may want to consider in the future. Talk to people, shadow professionals, and join some clubs to stay active and involved!

You may have noticed that this article is a bit different from my previous Green Chemistry articles, in so far as it lacks much chemistry. That's because this is my finale – the last article I will write for the Chemistry department here at Pitt. I've had an amazing journey here and I do not have enough space on this page to thank all the people who have helped me, but I'll give it a shot. Thank you to all my professors who have taught and dealt with me in class. If you know me in person, I'm sure you know I can be a pain in the ass. Thank you to all my advisors for giving me the amazing guidance that has helped me gain admittance into medical school. Without them, I would be as focused as a demagnetized compass. Thank you to all my friends for dealing with me for these three years when I succeeded and when failed time and time again – for being so amazingly kind and understanding. I honestly don't know where I'd be without them. Finally, thank you to my parents for continuing to believe in me all these years. I owe everything I have done to them.

As this article concludes, I want each of you to thank someone who has made your college experience wonderful. Many of you may not know how hard George, Flo (Regina), Deb, and so many other faculty work in the chemistry department to bring you these articles, so I want to extend my personal gratitude to them as well. Be sure to thank them in person! My concluding words of wisdom are: keep your head up, stay humble, and finish this year strong.

## **The Autosampler**

From the dark there comes a stirring, listen close, a motor purring,  
Frigid waters are disturbed, a single ripple rings.  
Through the murky walls and waters, creeps a shadow (impending slaughter?)  
Sluggish seconds slide while they await the coming sound.

Chugging towards its destination, short of any hesitation,  
It proceeds with great precision, passing row by row.  
Finally there is a stopping, then begins the dreaded dropping,  
Even, measured, resolute, extending ceaselessly.

With a pop the needle pierces, down to where the heart of fear is,  
Down to where the sample lies and liquid meets the air.  
Peering upwards at the heavens of a world within a vial,  
Bonds that squirmed with natural motion vibrate now in fear.

The human hair-sized radius then dips into the aqueous,  
Whirling currents swirl inside the wake of its small path.  
Pausing, only for an instant, it flashes with a wicked glint.  
Fragments of a protein, peptides, wait in dire suspense.

Then, without any forewarning, and hardly any time for mourning,  
The needle takes a greedy drink and up the peptides go.  
Defenseless against this blitz, they tumble round in frenzied fits,  
Panic and tumult ensue, there's nothing they can do.

Finally it stops imbibing, and the current is subsiding,  
Peptides who remain below are safe, at least for now.  
But those who have been whisked away won't live to see another day,  
The needle retreats through the hole, with a swig in tow.

Those forsaken cry in chorus "Pray for those who've gone before us,  
Where they went, we'll never know. What horrors they'll endure!"  
Reeling, still, from the irruption, they grieve over the abduction.  
Eventually they'll settle, as there's nothing left to do.

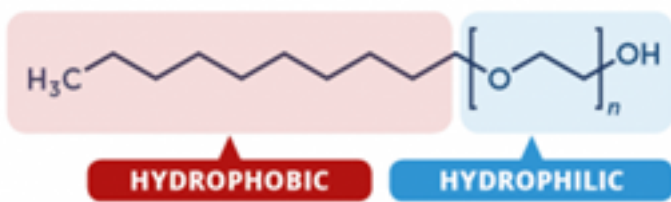


# The Chemistry of Laundry Detergent

By: Stephanie Liu, *Co-Editor*

If you're at all connected to the internet, then you've heard of the latest bizarre-o challenge craze sweeping through this great country's adolescent population. A quick Google search will reveal a plethora of videos showing teens doing the Tide Pod Challenge, which entails biting into detergent pods and experiencing immediate regret at the risk of severe bodily harm. While yes, these convenient detergent pods may look like plump colorful packets of juicy forbidden fruit, they are, in fact, LAUNDRY DETERGENT, used for, you know, laundering your clothes. They contain a myriad of chemicals that will wreak havoc on your organs, but are great for getting that wine stain out of your favorite sweater.

The pods themselves are encased in a thin film of polyvinyl alcohol (PVA) polymer that is water soluble. This film encapsulates the liquid detergent within, which is often brightly colored and bursting at the seams, giving the appearance of some kind of gummy candy. Once in water, this film will dissolve, releasing the detergent into your next load of laundry (or your esophagus!). This is when the surfactant molecules get to work. Most

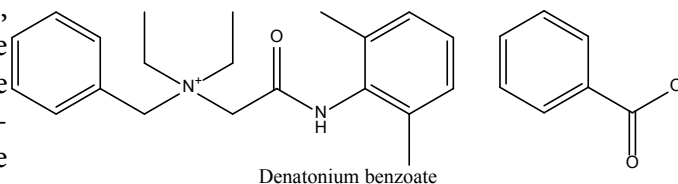


detergents use ethoxylated alcohols or alkylbenzene sulfonates, both of which fall under the umbrella of surfactants. These molecules consist of a hydrophobic end that binds to the grease and dirt in your clothes, and a hydrophilic end, that binds to the water in your washing machine, allowing that dirt and grease to be washed away from your clothes. These surfactants are particu-

larly dangerous when ingested due to their ability to affect cell membrane permeability, which could potentially cause a lot of problems for living creatures. Furthermore, many detergent solutions are highly alkaline, which can cause severe skin irritation or chemical burns.

The majority of laundry detergent's cleaning powers come from surfactants, although some may contain other compounds as well. Some brands of detergent contain enzymes that will digest compounds that stains are composed of, allowing them to be cleaned that way. Others contain brighteners, which are responsible for keeping your whites whiter than white. These compounds absorb UV light and emit it as visible blue light, giving the appearance of brighter whites. This also explains why people who wash their clothes with Tide before hitting the club will often glow.

Teens have no real excuse for wanting to eat Tide pods, but others might not know better, and unfortunately the consumption of detergent pods has led to death in the past. According to some news sites, from 2012 to mid-2017, the consumption of detergent pods has led to the deaths of 8 people, most of whom were actually adults suffering from dementia, along with young children. To discourage the eating of laundry pods, companies have



begun to add a compound called denatonium benzoate, the most bitter compound currently known to mankind, to the plastic films. All in all, eating Tide pods is going to be a highly, highly unpleasant experience, and, while I can't tell you what to do, I can strongly suggest that you don't.

## References:

1. <http://www.compoundchem.com/2018/01/25/laundry-pods/>
2. <http://www.telegraph.co.uk/news/2018/01/13/warning-alarming-tide-pod-challenge-detergent-eating-youtube/>